

before us these features are not treated, but presumably in the "Flora" they will be incorporated. Also it would add to the interest of the book if a summary of the principal ecological features were presented. It is evident from the published list of contributors that Mr. Davey has been successful in enlisting the services of many well-known systematists; but more workers are required, especially residents in the districts just north and east of Truro, also in Camborne and the country lying south. To these and to botanists visiting the county Mr. Davey will gladly supply copies of "the tentative list," which is interleaved for notes, so that their records may be returned to him in November, 1903, when the accumulated data will be worked up.

Outer Isles. By A. Goodrich-Freer. Pp. xv + 448. (Westminster: Constable and Co., Ltd., 1902.) Price 12s. 6d. net.

THIS book contains much valuable information about the Outer Hebrides and their people, and it is good service to have it put on record in accessible and readable form. Specially good are the accounts of the *Ceilidh*, or custom of "assembling together during the long winter nights to pass them off in happiness and mirth," and of the process of "fulling" or dressing the Harris cloth. But the work as a whole is blemished by a want of perspective. The natives of the Outer Isles are, after all, not without faults, and even vices, and some of their virtues are shared by inhabitants of the "adjacent islands of Great Britain and Ireland." There is something to be said on the side of the landlord, the Free Kirk, and even the sporting Sassenach, and the reiteration of their enormities on all possible occasions becomes very tiresome. It is not true that the people of the Outer Hebrides are "practically less known to the average Englishman than the inhabitants of New Zealand or of Central Africa," or that "those who penetrate to their islands, so far at least as they are represented by comfortable inns in easily accessible places, come back knowing nothing of the life of the people, and only ready to condemn them as half-savage, extortionate, and above all, idle."

The Fauna of British India, including Ceylon and Burma. Published under the authority of the Secretary of State for India in Council. Edited by W. T. Blanford. Rhynchota, vol. i. (Heteroptera). By W. L. Distant. Pp. xxxviii + 438. (London: Taylor and Francis, 1902.)

THIS important work continues to make steady progress, and we have now the pleasure to notice the appearance of another volume devoted to entomology, in addition to those already published by Sir G. Hampson on "Moths," Col. C. T. Bingham on "Hymenoptera" and Mr. R. I. Pocock on "Spiders." Mr. W. L. Distant is so well known as a close student of Rhynchota, and also for his careful and accurate work, that we have no doubt that specialists will find the present volume to be one of the most complete and satisfactory that has yet appeared on the subject; and it should give a great impetus to the study of Rhynchota, especially in India and in the adjacent countries.

Following Severin, Mr. Distant accepts fifteen families, eleven of which are represented in India, the first volume including descriptions of the Pentatomidæ, Coccidæ and Berytidæ. We may point out that Dr. D. Sharp's estimate of about 18,000 species of Rhynchota, quoted by Mr. Distant on p. xxxv, is obviously much too low, the number given by Mr. W. F. Kirby as long ago as 1892, in the second edition of his "Elementary Text-book of Entomology" (p. 14), being already 18,300. The volume is illustrated by 249 excellent text illustrations by Mr. H. Knight, including a series of very clear illustrations of structure in the introduction.

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LETTERS TO THE EDITOR.

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The Carnegie Institution of Washington, D.C.

SIR,—It gives me great pleasure to answer in writing some of the questions which you, and others who are interested in scientific research, have asked in respect to the scope of the institution lately founded in Washington by Mr. Andrew Carnegie.

To begin with, it may be well to recapitulate the facts already made known. The amount of his gift is ten million dollars (2,000,000*l.*), so invested that the annual income is five hundred thousand dollars (100,000*l.*). The control of this fund is invested in a board of twenty-seven trustees, selected from widely separated parts of the United States, and including many men who have won distinction and confidence by the service they have rendered in public life. It is not a board made up of specialists, but rather (if I may be allowed the expression) of generals—that is to say, of men accustomed to the administration of large affairs, political, financial, philanthropic and educational. Absolute power is given to this board to devise such methods and form such plans as may seem to them wise in order to carry out the purposes of Mr. Carnegie. These purposes he has clearly defined in the deed of trust and, with less formality, in the remarks which he addressed to the trustees when they first came together on January 29, 1902, under the chairmanship of the Hon. John Hay, Secretary of State, and recently the Ambassador of the United States in London.

In one general phrase, which reads as follows, Mr. Carnegie thus lays down the principle which has guided him:—"It is proposed to found in the city of Washington an institution which, with the co-operation of institutions now or hereafter established there or elsewhere, shall in the broadest and most liberal manner encourage investigation, research and discovery, show the application of knowledge to the improvement of mankind, provide such buildings, laboratories, books and apparatus as may be needed, and afford instruction of an advanced character to students properly qualified to profit thereby."

There are six points upon which the munificent donor then proceeds to lay emphasis, and these are, namely, the promotion of original research; the discovery and encouragement of exceptional men; the increase of facilities for higher education; the assistance of those now engaged in research; the bringing to Washington of students qualified to profit by the work carried on in the several departments of the Government; and finally, the publication of scientific memoirs.

So far all was clear. Mr. Carnegie's part was performed. Now began the perplexities and responsibilities. The trustees, many men of many minds, must take the subsequent steps. Fortunately, there was no occasion for hasty action; at the outset no buildings were to be constructed, no faculty was to be brought together. Such considerations could be postponed indefinitely. The trustees decided to take time for reflection and for conference with the leaders of science at home and abroad, before the adoption of a programme. Letters were addressed to many persons who could not be reached in person. Confidential interviews were secured with those who could be seen in Europe and the United States. The experience of existing institutions was studied, such as the Royal Society, the Royal Institution, the Academies of Science in Berlin, Munich, Vienna, Paris and other cities. Attention was given to the conditions which have helped or retarded the progress of eminent men during the last generation

—Darwin, Pasteur, Helmholtz, Abel and Virchow for example, in Europe—Henry, Agassiz, Dana and Rowland in America—and also the encouragements and discouragements which are encountered by the men of to-day. Time will be required for the digestion of this material in order to discover the methods which are most efficacious in the advancement of knowledge.

Meanwhile, much co-operative counsel will be given by experts in various branches of learning. As soon as the general purposes of Mr. Carnegie's foundation were made known, hundreds of applications for assistance were received—the number of self-discovered "exceptional men" was large. The number of trivial applications for help in the prosecution of researches was surprising; but, on the other hand, the number of well-considered, important, fundamental inquiries suggested by men of the highest rank among the promoters of knowledge indicated that the entire income would all be absorbed at no distant day. Discrimination, therefore, became the paramount virtue—discrimination which should meet the approval and, if possible, the concurrence of the world's wisest men.

For this discrimination, the aid of specialists was indispensable. The astronomer was not the man to judge of biological claims, nor the chemist of economic problems. No board of "generals" could wisely act without the aid of a strong advisory staff of "adjutants." Accordingly, the authorities of the Carnegie Institution proceeded to select and enlist a number of advisory committees. Three, four, or five well-known authorities were chosen in each of the principal branches of science. All their expenses for travel and for clerical assistance were generously paid by the fund, but their services, like those of the trustees, were cheerfully given to the public without remuneration, and often at the sacrifice of time and convenience. Their hearty co-operation is a fresh illustration of the public spirit of men of science in our day, and their readiness to appreciate and help on the most deserving claims, irrespective of local or personal preference, augurs well for the efficiency of the Carnegie Fund and for the wisdom of the plans that will presently be adopted.

More specific announcements cannot be made until the trustees come together for their second meeting at the close of November next.

A careful perusal of Mr. Carnegie's language will bring out several points, to some of which I will venture to call attention. Here we have that special "endowment for research," which has been during the last thirty years and more the desire of so many men in England and America. This endowment is independent of any existing academy, university or school of technology; but it may co-operate with any that now exist or that may be established. It does not establish a university in Washington, which so many have advocated and so many have disapproved. Mr. Carnegie on this point is explicit and decided. The efficiency of the new institution is not restricted by any local, political or ecclesiastical fetters. Nor is there any attempt to decide what science includes. None of the progressive organised and systematic branches of knowledge are excluded. Economic, historical and archaeological inquiries may be aided as well as those which are more obvious to the public—physical, chemical, biological, geological and astronomical researches. Education may be encouraged, but it must be by the personal development of uncommon talents,—the advanced student, the young professor, "the exceptional man." To the last clause of his deed of trust, Mr. Carnegie attaches the highest importance. It corresponds with a clause in his gift to the Scotch universities. The trustees by a majority of two-thirds "may modify the conditions and regulations under which the funds may be dispensed"—if time, experience and changed conditions call for new arrangements.

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I cannot close this letter without reference to the great interest which this gift has aroused in all scientific circles at home and abroad. During the past summer, spent upon the Continent and in Great Britain, I have had the honour of talking with many men of eminence, everywhere known as investigators, and their counsel, suggestions and co-operation are not only an indication of the international character of science, but they give an assurance that the most enlightened experience of the world can be enlisted in the plans of this new foundation. At home, "it goes without saying," that there is the heartiest response to Mr. Carnegie's generosity.

With a grateful appreciation of the work of NATURE in the persistent advocacy of research. DANIEL C. GILMAN,
London, September 9. President of the Carnegie Institution.

Re Vegetable Electricity.

WITH reference to Dr. Waller's letter in NATURE, September 18, I confine my reply, in the limited space courteously offered me, to the main issue, *i.e.* the priority of research on the electric response of ordinary plants under mechanical stimulus. My footnote to my Linnean Society paper gave the published dates which must determine, as usual, such a question. It would only obscure the issue were I to take up here assertions resting solely on Dr. Waller's personal affirmation.

My statement which Dr. Waller wishes to traverse is definite enough, and may be answered in a definite manner. He has not done this. I stated that five months before the communication of his paper to the Physiological Society (November 9, 1901), Dr. Waller *heard* me describe my results on the electric response of ordinary plants under mechanical stimulus. My paper on the "Electric Response of Inorganic Substances: Preliminary Notice," was communicated to the Royal Society on May 7, 1901 (*i.e.* six months before Dr. Waller's communication to the Physiological Society). I read it before the Society on June 6. From the concluding portion of this paper I quote the short summary of the results obtained with plants.

"An interesting link between the response given by inorganic substances and the animal tissues is that given by plant tissues. By methods somewhat resembling that described above, I have obtained from plants a strong electric response to mechanical stimulus. The response is not confined to sensitive plants like *mimosa*, but is universally present. I have, for example, obtained such response from the roots, stems, and leaves of, amongst others, horse-chestnut, vine, white lily, rhubarb and horse-radish. The current of injury is, generally speaking, from the injured to the uninjured part. A negative variation is also produced. I obtained both the single electric twitches and tetanus. (Two response curves given to exhibit this.) Very interesting also are the effects of fatigue, of temperature, of stimulants and of poison. Definite areas killed by poison exhibit no response, whereas neighbouring unaffected portions show the normal response."

Dr. Waller not only heard me describe these results, but took part in the subsequent discussion of my paper. It is indeed very strange that he should on that occasion have said absolutely nothing about his being engaged in this particular investigation. An eminent physiologist declared during the discussion that the electric response of ordinary plants under mechanical stimulus was an impossibility. Dr. Waller, who immediately followed him, it is again remarkable to note, had not one word to say for the possibility of such a phenomenon! These facts are as significant as the fact that Dr. Waller communicated his paper five months after he had discussed mine at the Royal Society.

The above will dispose of the question of priority. My Linnean Society paper and Dr. Waller's paper read before the Physiological Society are now before the public. From these, anyone interested in the subject will be able to determine the scope of the two investigations, the novelty of the appliances and methods employed, and the accuracy of the results obtained.

JAGADIS CHUNDER BOSE.

THE claim for priority comes from Prof. Bose—implicitly by the note to his paper at the Linnean Society, to which I had to demur—explicitly in his present reply. Prof. Bose bases his claim on the final paragraph of a paper of June 6, 1901, now in